Social cognitive and developmental psychology explaining linguistic patterns:

Theory of mind, epistemic vigilance, natural pedagogy, and the typology of Uralic generics, evidentials, and possessives[1]

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1. Introduction

The goal of this article is to sketch how linguistics can benefit from the findings of cognitive science. The topics in linguistics that serve as examples in this paper are various and, at first glance, they seem to have little to do with each other: genericity, evidentiality, and briefly, possessives. Cognitive approaches, especially those of developmental psychology and social cognition, will be shown to be promising in explaining the commonalities between these categories.

The starting point for this article is interdisciplinary. Recent interest in linguistics, philosophy, and psychology has converged on the topic of genericity, because the time has come when each of these fields has reached its limits in addressing the topic within the limits of one single discipline. A joint pursuit for answers has yielded good results so far.[2] This article widens the scope of research, joining the agendas of cognitive and linguistic research by extending them to evidentiality and possessives.

Generic sentences provide general knowledge about kinds and generally shared cultural knowledge, such as (1):

(1a) *Tigers are striped.*

(1b) *Ticks carry Lyme disease.*

Linguistic literature is hesitant to streat genericity or generics as a proper grammatical category, since this analysis would introduce problems that are not so obvious in other categories.

Let us look at the realization of meaning and functions. In the ideal case, each category is expressed by a dedicated formative. On the one hand, genericity does not have regular grammatical markers in most languages,

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[1] I am grateful to the anonymous reviewer(s) for their comments. I am solely responsible for all errors.

[2] I owe thanks to Gergely Csibra for pointing out many issues where the linguistic data on generics and evidentiality are useful for developmental psychology.

although its meaning can be grasped easily across languages and age groups. Sentences such as *Tigers are striped* can be rephrased as in (2) by adjoining the generic adverbial *in general*.

(2) *Tigers in general are striped.*

In example (2), the part represented by *in general* is not grammaticalized in most known languages. Whether the phrase *in general* appears in the sentence does not matter much for the interpretation; the sentence is interpreted as generic.

On the other hand, generics do not only have a "form problem" – more specifically, the problem of lacking a marker, as described above. Additionally, they have a "meaning problem" as well – namely, they do not have well-defined semantics either, despite the fact that they are easy to understand as generic. Some tigers lack stripes, but native speakers would nevertheless accept the sentence as in (1a) as a grammatical and interpretable sentence. Few ticks carry Lyme disease, yet the sentence in (1b), *Ticks carry Lyme disease*, is a grammatically correct sentence that is interpreted generically.

Moreover, generic adverbs do not combine with all generic sentences. Unlike in the sentence *Tigers are striped,* the phrase *in general* cannot be adjoined to the sentence *Ticks carry Lyme disease.*

(3) *%Ticks in general carry Lyme disease.*

Therefore, clear evidence for a unique relationship between the form and the meaning cannot be pinned down well enough to establish a unique form–meaning relationship that characterizes better-defined grammatical categories. Compare this elusive category to negation, for instance. Negation is attested in all well-studied languages and, despite considerable variations in meaning and use and its deviations from logical negation, the core meaning of it is still less problematic to capture.

Many interdisciplinary questions arise from the study of the interpretation of generic sentences. Is the generic interpretation of a sentence an interpretation, a pragmatic implicature, or a grammatical category? Is the interpretation of a generic sentence a matter of grammar, or is it a matter of context? And, last but not least, why should we care about an interpretation without proper and cross-linguistically regular encoding? Why do all known languages encode negation, for instance, but typically not genericity? Do we gain anything from studying a topic that does not clearly constitute a linguistic category, without a fixed pair of form and meaning in languages that are described well enough to base conclusive decisions upon?

Looking more closely at the data, similar problems of context-or-grammar emerge in other categories that are known to be more clear-cut, such as evidentiality. Evidentiality is the grammatical category that pertains

to the nature of evidence for what the speaker expresses. In the Estonian sentence in (4), there is a clear evidential morpheme *vat,* which is set bold in *tule**vat.***

(4) *Homme* *tule-**vat*** *ilus* *ilm.*
tomorrow come-PTV_EVID beautiful[NOM] weather[NOM]
'Tomorrow, they say, the weather will be fine.'

A clearly delineated meaning is associated with the form *vat*. The form *vat* indicates that the speaker has obtained evidence for the prospects of good weather from another speaker. Typically, the speaker uses *vat* to mediate information that is incomplete for her. In sum, there is evidence for a unique meaning–form pair. It is true that the evidential category is attested across languages, and its existence has been verified by native intuition, introspection, elicitation, questionnaires, and corpus studies. However, the interpretation of evidential sentences has still not been pinned down. This could be done with experiments that would tease apart its meaning and use, and by means of comparison with other similar phenomena.

One inadequately addressed point where evidentials – at least some of them – and generics are similar in interpretation is the lack of obligatory and clear marking. Not only generic but also evidential interpretations arise without overt category markers. As in the case of the phrase *in general* in the sentence *Tigers in general are striped,* some but not all evidentials may be omitted without any clear loss of information for the hearer, as will be discussed in further sections. In other words, an evidential interpretation can emerge in a sentence that does not contain grammatical evidentials but instead evidential adverbials, for instance, or a suitable context – exactly as is the case with generics.

There is another observation that makes a scrupulous linguist wonder what the common mechanism behind the distributional properties of generics and evidentials is. Curiously, no evidentials occur in the data set of CHILDES that I studied for Estonian generics. Generics and evidentials seem to be mutually exclusive in child language and in child-directed language. This fact suggests that at least in some languages, partly similar explanations are plausible for the occurrence of the two categories.

Moreover, if similar explanations can be found for phenomena that belong to two diverging categories, then it is predicted that these explanations could be useful in more areas of language. The category of possession has been added to the discussion for the sake of comparison. Possessives such as *Mary's book in* (5) are expressions that relate two entities: the possessor (Mary) and the possessee (book).

(5) *Mary's book.*

In sentence (5), the asymmetrical relationship between Mary and the book is that of ownership. Mary possesses or owns the book. In this example, it is the possessor that bears the possessive marker. Possessive relationships are much more variegated and abstract across languages than the simple asymmetrical relationship shown in (5). In addition, their marking diverges across languages from the type represented in (5).

Some less prototypical possessives will be chosen for a possible extension of the explanatory power of cognitive approaches to generics and evidentials. Several Uralic possessive phenomena involve more abstract possessive relationships. Possessive markers, especially for third person, resemble determiners and are much like the English definite article "the" in their usage in, for instance, Udmurt. However, in Udmurt, the second-person possessive markers on the possessee indicate which viewpoint to take in order to comprehend the narrative. In other words, the possessive marker functions as a linker between discourse participants and event participants, because it marks the event participant with whom the hearer should most closely identify to follow the narrative more easily. The occurrence and interpretation of these possessive markers in Udmurt will thus be presented as an example of how the causal mechanisms that shed light upon the distribution of the generic and evidential expressions can explain a wider set of data.

More specifically, the data will be explained in terms of developmental psychology and social cognition. Social cognition pertains to how people process social information: its encoding, storage, retrieval, and application to social situations. Developmental psychology studies the psychological processes of development. This paper adopts an explanation from developmental psychology that relates to natural pedagogy. Recent research in developmental psychology and social cognition will be integrated to explain patterns in languages that encode a richer set of linguistic cues for generics, evidentiality, and possessives.

Within cognitive research, these grammatical categories are examined with reference to theory of mind, natural pedagogy and the mechanisms of epistemic vigilance. Theory of mind (ToM) is the ability to attribute mental states to oneself and others and to understand that others have beliefs, desires, and intentions that are different from one's own (Premack & Woodruff 1978). Natural pedagogy refers to a system of cognitive mechanisms that enable the transmission of cultural knowledge by communication between individuals, and represent an evolutionary adaptation (Csibra & Gergely 2011). Epistemic vigilance (EV) is the cluster of mechanisms that enable us to detect the insufficiency of the information communicated, such as errors and deception (Sperber et al. 2010).

Based on theory of mind and epistemic vigilance, I propose a way of motivating a typology of languages. The example concerns the evidential

category. It has been hard to pin down consistent typological differences between evidential systems (cf. Aikhenvald 2004, van der Auwera & Plungian 1998, Faller 2002). I propose dividing languages into those that reflect theory of mind and those that reflect epistemic vigilance. This distinction builds upon insights that explain the mutually exclusive contexts of evidentials and generic expressions and that relate to the distribution of intersubjective possessive expressions.

The structure of the exposition of these ideas is as follows. The data, evidential, and generic puzzle are presented in Section 2 alongside the special role of the possessives linking the hearer perspective to the participants of the narrative. This is followed by the analysis in Section 3, which also involves a more in-depth discussion of the categories, concepts, and phenomena. Since this article is exploratory in nature and not intended to present definitive conclusions but to draw linguists' attention to a new area, developmental social cognition, in the study of a variety of little understood phenomena in some Uralic languages, Section 4 formulates some relevant questions for further research. Some concluding remarks on the topics discussed in Sections 2 to 4 can be found in Section 5.

2. The data

Why these data? The links between these seemingly distant categories have not yet been established, and the social cognitive and developmental perspectives allow us to detect new connections within the data. Needless to say, the results raise many intriguing research questions for future study. Why were the links not discovered earlier? On one hand, the languages that are typically the focus of in-depth studies generally lack designated evidential markers or linguistic cues for generics and, therefore, the question of the relationship between generics and evidentials was never asked. On the other hand, possessive markers have not been discussed in connection with evidentials or generics, because the possessive relationships in the languages that are more thoroughly discussed do not have the properties of the Uralic possessive suffixes.

This section discusses the data on genericity and evidentiality and introduces the concepts in more detail to demonstrate the puzzling nature of the phenomena (Section 2.1). The section also introduces some related issues, such as several evidential strategies and possessive markers (Section 2.2).

2.1. Some puzzles

At first sight, the topic of genericity and evidentiality may seem to have too little in common to be comparable. However, the following three novel data

observations about the distribution of the linguistic cues for genericity and evidentials in Estonian help pinpoint some essential features for an analysis of evidentiality.

The first observation is that generic statements as in (6) do not tend to occur in sentences marked with an evidential (the indirect evidential, the partitive evidential; see Tamm 2008, 2009, 2011, 2012), as in (7).

(6) Estonian
Generic, no evidential
Tiigri-d *on* *triibulise-d.*
tiger-NOM.PL be.3S striped-NOM.PL
'Tigers have stripes.'

(7) Estonian
Evidential, not generic
Naabri *kassi-d* *ole-**vat*** *triibulise-d.*
neighbor.GEN cat-NOM.PL be-PTV_EVID striped-NOM.PL
'Allegedly, the cats at the neighbor's house are striped.'

The observation above is detailed with the following fact: while constructed sentences that combine a generic statement and an evidential are marginally acceptable for native speakers, as in (8), they are not typical in spontaneous speech.

(8) Estonian
Evidential
?*Tiigri-d* *ole-**vat*** *triibulise-d.*
tiger-NOM.PL be-PTV_EVID striped-NOM.PL
'Allegedly, tigers are striped.'

Secondly, the CHILDES corpus includes no instances of the Estonian indirect-partitive evidential, as in (7), but it provides examples of generic statements, as in (6).[3] The age of the recorded children is under three. What explains this discrepancy?

The third puzzle concerns the optionality of the evidential. According to traditional Estonian grammar, the indirect-partitive evidential is "quotative", but paradoxically, this form is never used in, for example, quotations, as in scientific texts – an observation backed up by native intuitions and introspection. Estonian has a two-term evidential system; most evidential systems are two-term systems (Aikhenvald 2004). In Estonian, indirect

[3] Reili Argus (p.c.) comments on the data in CHILDES that the use of the adverb *ammu* 'long ago' by a child could function to communicate to the caretaker that the situation is not true at present, and perhaps it can also function as a sort of evidential. For instance, a sentence such as *Long ago, toys are on the bed* serves to indicate that it is a good topic to talk about toys on the bed, but one should not expect to find the toys there at that very moment.

evidence is morphologically marked, and other types of evidence are unmarked.

Languages may have typologically similar systems and yet differ in the degree to which marking evidentiality is obligatory. Grammatical evidentiality marking in Estonian is optional, as demonstrated in (9). This example tests indirectness by means of the adverb *kuuldavasti* 'allegedly', but grammatical marking through evidentials is not obligatory.

(9) Estonian

Naabri	*kassi-d*	*on/ole-**vat***	*kuuldavasti*
neighbor.GEN	cat-NOM.PL	be.3S/be-PTV_EVID	allegedly
triibulise-d.			
striped-NOM.PL			

'Allegedly, the cats at the neighbor's house are striped.'

The preliminary comparative data show that in Turkish, marking evidence is more obligatory than in Estonian, including in child language (Aksu-Koç et al. 2009). Cognitive experiments also show that in Turkish, which has evidentials, children are less gullible than in English, which does not have explicit grammaticalized evidentials. It is possible that the existence of evidentials in a language enhances social cognitive development. The social cognitive abilities of combating deception and evidential grammar seem to be dependent on each other.

There are thus three observations that have no explanation in Estonian:

1. Generic statements as in (6) do not tend to occur in sentences marked with an evidential.
2. The CHILDES corpus includes no instances of the Estonian indirect-partitive evidential, but it provides examples of generic statements. According to Reili Argus (p.c.) there is one example of the form, but it occurs in an embedded sentence, not in a main clause.
3. Evidential markers are optional in contexts where they would be required according to the logic of applying evidentials. For instance, in contexts such as quotations of others (*Kolumbus ütles, et maakera on ümmargune* 'Columbus said that the earth is round'), we would expect the verb *on* to appear in the evidential form, as *olevat*, because the clause is a quote, and we have never experienced the roundness of the earth directly. Yet, *olevat* is optional and in fact dispreferred in this context. In languages with obligatory evidentials, an evidential form would be used in this context.

2.2. Related issues: several evidential strategies and possessive markers

This section makes a digression into Udmurt, presenting a sample of its evidential strategies as well as possessive marking in narratives. The following excerpt in (10) stems from the source in Kel'makov (1981: 126–

127) cited in Edygarova (2012), and it features many challenging issues.[4]

(10) Udmurt

(a) *роман карт'ин-лэн,* ***пэ,*** *ок. пол* *коз-эз*
Roman Ekaterina-GEN **s/he said** one.time goat-**3S**
ыш-эм…
get.lost-**2PRT.3S**
'Once one of Ekaterina Romanovna's goats got lost.'

(b) *ну,* ***пэ,*** *курэкт-э* *ук* *ни*
PRTC **s/he said** grieve-PRES.3S PRTC already
карт'ин-эд.
Ekaterina-**2S**
'Ekaterina became very sad.'

(c) *оло. кы˙-ти* *но* *учча-л'л'ам* *ӧвӧл*
everywhere-PRL PRTC search-**2PRT.3PL** NEG
шэт'т-ил'л'ам.
find-**2PRT.3PL**
'They looked for [it] everywhere – they did not find [it].'

(d) *с'ик-ыс'* *но* *учча-л'л'ам,* *нокыт-ын*
forest-ELA also search-**2PRT.3PL** nowhere-INS
но, ***пэ,*** *ӧвӧл* *коза-зы…*
PRTC s/he said NEG goat-**3PL**
'They looked for [it] also in the forest – the goat is nowhere…'

(e) *тарэ* *санко ван'ка* *мун'чо-э* *пу*
now Alexander Ivan sauna-ILL firewood.ACC
ну-э *выл-эм.*
bring-PRS.3SG AUX-2PRT.3SG
'Then [once] Ivan, the son of Alexander was bringing firewood to a sauna.'

(f) *соку* *ай* *санко-ос* *роман-йос-ын*
this.time still Alexander-PL Roman-PL-INST
ӵош *ул-о* *вал.*
together live-PRS.3PL AUX.1PRT
'At this time the family of Alexander still lived together with Roman's family.'

[4] Different cognitive abilities relate in different ways to language and language acquisition. From this perspective, languages with many evidentials or evidential strategies are challenging. However, it is not clear what is the status of the evidential strategies in languages that have several of them. The Uralic languages provide several such languages.

(g) *йа, тарэ ван'ка, пичи макэ ай,*
well now Ivan small something still
пу ***пэ,*** *ну-э.*
firewood.ACC s/he said bring-PRS.3SG
'Well, Ivan – he was still a child – is bringing firewood.'

(h) *ну-он с'ам-ен-ыс со-ид мун'чо укно-э*
bring-PTC nature-INST-3S he-**2S** sauna window-ILL
учкыны öвöл-а шэт'т-эм.
look.INF NEG-INTR find-2PRT.3SG
'On the way he accidentally looked at the window of the sauna.'

(i) *пу-эз но та-ид-лы кулэ öвöл ни,*
firewood-**3S** even he-**2S**-DAT need NEG already
пэ, *до.л-дол шултыр-ша'лтыр куштыы-са*
s/he said everything crash throw-GER
кэл'т-эм.
leave-2PRT.3S
'He did not even need firewood any more; he dropped it and left it behind.'

(j) *кук-йос-ыз но, **пэ**, у-г ни*
leg-PL-**3S** even s/he said NEG.PRS-3 already
йöтыл-о.
touch.CNG-PL
'He ran away very fast.'
(Lit. 'His feet do not touch [the ground] anymore.')

Firstly, the narrative morpheme marked in boldface in (10a), (10c), and (10d) functions as an obligatory evidential strategy – a finite clause narrating the past should encode tense. The exact examples are repeated and marked in bold below.

(10)'

(a) *роман карт'ин-лэн,* ***пэ,*** *ок. пол коз-эз*
Roman Ekaterina-GEN **s/he said** one.time goat-**3S**
*ыш-**эм**...*
get.lost-**2PRT.3S**
'Once one of Ekaterina Romanovna's goats got lost.'

(c) *оло. кы'-ти но учча-**л'л'ам** öвöл*
everywhere-PRL PRTC search-**2PRT.3PL** NEG
*шэт'т-**ил'л'ам.***
find-**2PRT.3PL**
'They looked for [it] everywhere – they did not find [it].'

(d) *с'ик-ыс'* *но* *учча-л'л'ам,* *нокыт-ын*
forest-ELA also search-**2PRT.3PL** nowhere-INS
но, ***пэ,*** *ӧвӧл* *коза-зы…*
PRTC **s/he said** NEG goat-3PL
'They looked for [it] also in the forest – the goat is nowhere…'

Secondly, there is a particle *пэ*, which is glossed as 's/he said', set in bold above in (10a) and (10d). The particle seems to be almost obligatory, but the occurrence is subject to restrictions other than those of a bound morpheme. Clause boundaries and prosodic boundaries may influence its occurrence, but various strategies of creating an extra effect with the narrative seem to determine if *пэ* is used in a clause at all; the clause in (10c) for instance does not have the particle.

Thirdly, there is another strategy that is similar in its essence to evidential strategies in its optionality and its special function in narratives. However, that phenomenon belongs again to a seemingly unrelated category – possessive suffixation that occurs in several Uralic languages, such as Finnish and Hungarian. In Udmurt, one of its functions is to link the speech event and the narrated event. This strategy involves the use of possessive suffixes: the goat in (10a) and in (10d) marked with the third-person possessive markers and Ekaterina in (10b) with the second-person possessive marker. The goat in the narrative belongs to Ekaterina in this sample, but in other samples, the possessive suffixes may act as demonstratives close to definite articles, such as the English 'the'. Unlike *Mary's book*, where the possessor receives the possessive marker, in Udmurt and several other Uralic languages, it is the possessee that carries the marker. In 'Ekaterina's goat', the possessee 'goat' is marked with a possessive suffix and the possessor is marked with the genitive.

(10)''

(a) *роман карт'ин-лэн,* *пэ,* *ок. пол* *коз-эз*
Roman Ekaterina-GEN s/he said one.time goat-**3S**
ыш-эм…
get.lost-2PRT.3S
'Once one of Ekaterina Romanovna's goats got lost.'

(b) *ну,* *пэ,* *курэкт-э* *ук* *ни*
PRTC s/he said grieve-PRES.3S PRTC already
*карт'ин-**эд**.*
Ekaterina-**2S**
'Ekaterina became very sad.'

(d) *с'ик-ыс'* *но* *учча-л'л'ам·* *нокыт-ын*
forest-ELA also search-2PRT.3PL nowhere-INS
но, *пэ,* *öвöл* *коза-**зы**...*
PRTC s/he said NEG goat-**3PL**
'They looked for [it] also in the forest – the goat is nowhere...'

The more interesting case is the second-person singular possessive marking on the proper name Ekaterina (10b) and the pronoun that stands for Ivan (10h, i). Previous accounts have not yet discussed this phenomenon on the basis of longer narratives (Nikolaeva 2003), so I offer a possible analysis.[5] Although possessives prototypically encode an asymmetric relationship between two entities, one of which is a possessor and the other one is possessed (Heine 1997), the relationship in this instance is abstract.

The second-person singular functions as an evidential and a deictic, linking the speech participants to the event. At this point, the knowledge state of the speaker is updated with new information about the knowledge state of the hearer. In other words, the speaker is aware that a specific Ekaterina, Ekaterina Romanovna, has already been introduced to the hearer. Now the speaker tries to involve the hearer by communicating the emotional perspective of Ekaterina. The speaker wants the hearer to feel exactly like Ekaterina in order for the hearer to appreciate the rest of the narration. How can emotions be involved in perspective-taking? The English translation ('Ekaterina became very sad') does not reflect the emotional effect brought about by the second-person possessive marking that is used in Udmurt to create emotional perspective-taking (literally, 'your Ekaterina became very sad'). By means of the second-person possessive marker on 'Ekaterina', the hearer understands 'Ekaterina became very sad' at the level of Ekaterina's emotions as if they were his own emotions, and, therefore, emotionally expects a solution to Ekaterina's sadness in the ensuing narrative. In Udmurt, the perspective is shifted from the Self (the hearer) to the Other (Ekaterina) by identifying the Other (Ekaterina) as part or possession of the Self, and thus merging the perspective.

In examples (10h) and (10i) the third-person pronoun refers to Ivan, who is a newly introduced participant in the narrative. In these examples, the function of the second-person possessive marking on the pronoun is to link the perspective of the hearer to Ivan's emotional perspective. The speaker aims engage the hearer to make the narrative enjoyable. Specifically, the speaker wants the hearer to put himself in the shoes of little Ivan, who goes to fetch firewood, gets frightened by the unexpected goat at the sauna and escapes, leaving everything behind. The plot of losing and finding a goat is rather uninteresting in itself, but the grammatical devices used for inducing

[5] Many thanks to Svetlana Edygarova for her help correcting the presentation of the Udmurt example and verifying its interpretation.

emotions in the hearer render the story dramatic and amusing. The scene in which little Ivan is frightened by the goat is simultaneously the solution that the hearer has been craving because of his identification with Ekaterina's sadness.

(10)'''

(h) *ну-он* *с'ам-ен-ыс* *со-ид* *мун'чо* *укно-э*
bring-PTC nature-INST-3S he-**2S** sauna window-ILL
учкыны *ӧвӧл-а* *шэт'т-эм.*
look.INF NEG-INTR find-2PRT.3SG
'On the way he accidentally looked at the window of the sauna.'

(i) *пу-эз* *но* *та-ид-лы* *кулэ* *ӧвӧл* *ни,*
firewood-3S even he-**2S**-DAT need NEG already
пэ, *до˙л-дол* *шултыр-ша˙лтыр* *куштыс-са*
s/he said everything crash throw-GER
кэл'т-эм.
leave-2PRT.3S
'He did not even need firewood any more; he dropped it and left it behind.'

The speaker now invites the hearer to follow the narrative from the perspective of the boy, rather than that of Ekaterina. Assuming that Ekaterina and Ivan are present in the hearer's mental representation, the speaker directs the hearer's attention to these event participants when the narrative turns to events that are better understood when one feels empathy towards a particular referent. The referent with whom the hearer should empathize is the one who suffers losses or perceives events in this excerpt. In this narration it is first Ekaterina and then Ivan.

The hypothetical necessary and sufficient conditions of using the possessive form would be fulfilled if its use were governed by semantic principles. Semantic constraints would pertain to the existing context at first mention after the introduction of the referent. However, the hypothetical semantic constraints are not realized, and the question of optionality arises again. There are two arguments against a purely semantic analysis of the possessive markers. (This does not automatically mean that the sentences and markers do not have semantics.)

Firstly, the hypothetical necessary condition in the context is not an issue, because the second-person singular is not automatically and obligatorily used after first mention of the discourse referent.

Secondly, the context is not sufficient; note that the second-person possessive marker is not used to mark other participants in the event, such as the goat that is mentioned and has a role all through the narration. The goat is consistently marked with the third-person possessive suffixes. Originally it

could be interpreted as belonging to Ekaterina, but as the narration proceeds, it "belongs" to the whole narration rather than to Ivan, the more accessible antecedent. So the third-person possessive functions as a definite article in the narration. Not even the boy's body parts receive the second-person possessive marking in the narrative, despite being specific in the discourse as part of the referent already introduced.

Only one event participant – specifically, the one whose perceptional and emotional perspective makes it easier for the hearer to understand the narration – is marked by the second-person possessive suffix. What will be relevant in the ensuing narration should be regarded as relevant from Ekaterina's or Ivan's perspective in the narration, and the attention of the hearer is shifted from Ekaterina to Ivan by placing the second-person possessive suffix on the NPs with the respective referents.

The digression into the realm of possessive marking is not arbitrary but shows a wider context for evidentiality-like mechanisms. The use of the second-person possessive pronouns as linkers of speech and narrative events does not amount to an evidential, nor even an evidential strategy. However, it shares some important properties with evidentiality marking. Its felicitous use relies on the same normal development of social cognitive abilities as evidentiality does. Evidentials as well as linkers of speech and narrative event participants require a developed theory of mind, the ability to see the evolution of the narrated events from the viewpoint of the other – the other participants in the speech event in this case. If this idea is correct, then we can formulate two predictions:

- Evidentials and these possessive suffixes are acquired at a similar age.
- Persons with impaired cognitive abilities such as autism are likely to fail in the felicitous use of these morphemes in a similar way.[6]

2.3. Conclusion of Section 2

The analysis that I have offered of the Udmurt data shows that the puzzles about the lack or the expression of generic or evidential markers can benefit from a wider look at the grammatical categories, extending beyond simply their formal or functional features, which characterize generative and typological sources.

Most importantly, what has been frequently referred to as intersubjectivity gains significance in the descriptions of the data. Intersubjectivity is an interdisciplinary term used to conceptualize the psychological relation between people. In linguistics, intersubjectivity is understood to be the grammatically or lexically expressed perspective of the

[6] This prediction is confirmed by Svetlana Edygarova (p.c.), who reports about infelicitous use of second-person possessives by a mentally handicapped person.

speaker where she takes the perspective of the hearer into account and adjusts her message accordingly (cf. the linguistic understanding of the interdisciplinary term in Verhagen 2008). The evidential and generic examples have demonstrated intersubjectivity. More specifically, there are specific grammatical means related to the use. These means depend on the role and developmental stage of the communicators. Speakers adjust the encoding of their utterances to the mental representations and cognitive biases of the hearers. In natural pedagogy, children are keyed to receiving general knowledge, and caretakers adjust themselves to this bias. Typological data point to the grammaticalization of the communicative differences between cross-linguistic categories. The use of possessives is keyed to the knowledge of the speaker about the hearer's mental representations, and her intentions to guide him in understanding the narrative. All these facts direct us to a more social cognitive and developmental approach to the distribution of the particular data collected from the Uralic genericity, evidentiality, and possessives.

3. Analysis

Seemingly unrelated observations about languages are explained by the role of evidential versus generic sentences in communication and by some developmental peculiarities of social cognition. This section presents the analysis that explains the nature of evidentials as opposed to generics in communication (Section 3.1). Two types of evidentials are proposed in Section 3.2. A more detailed discussion of generics is carried out in Section 3.3. The optionality of evidentials in languages is added as relevant information for future typologies in Section 3.4. Section 3.5 offers explanations of the data.

3.1. Evidentials versus generics in communication

I propose that indirect evidentials and generic statements do not co-occur in the data set, because in terms of intersubjectivity they convey contradictory information in the particular context of communication. In a nutshell, if the hearer is an infant, then he is looking for cues to understand the world around him and would trust the person giving him the information that helps him understand. The speaker takes this perspective into account and adjusts her message accordingly.

How does the contradiction relate to the episodic–generic distinction and to evidentiality? Typically, generic sentences provide general knowledge about kinds (6), whereas evidentials mediate knowledge that is typically episodic and pertains to particular events, or to situations with specific referents (7). The combination of an Estonian indirect-partitive evidential as in (7) and a generic sentence such as in (6) and (8) is grammatically well-

formed, but the interpretation of (8) is crucially different from that of (6). Whereas *Tigers are striped* is generic, the evidential sentence, *Allegedly, the tigers are striped* — as in Estonian in (8) — is clearly not generic. It asserts incomplete evidence for the proposition and relates the current speech event to a specific previous speech event with a different source of information. Contrary to (5), the speaker does not convey common knowledge in this sentence. Instead, she conveys episodic information linked to particular other speaker(s) via specific speech events. Moreover, she conveys information that does not reflect the beliefs of the speaker of (8). For example, in her world, tigers might be albino.

However, how can we explain the lack of evidentials and abundance of generics in the CHILDES corpus? The developmental data can be explained by the contradictory nature of generic and evidential information: the mothers recorded in CHILDES do not combine generic information and evidentials because it would be difficult for a child to process, and so children do not acquire the evidential. They are keyed to the generic, not episodic knowledge coming from the caregiver.

Another promising avenue in explaining the discrepancy is related to the development of social cognitive abilities of children. The following sections detail the explanations proposed here.

3.2. Two types of evidentials

I propose that, developmentally, there are two types of evidentials that can be distinguished within the two-term evidential systems:

a) evidentials that require a developed theory of mind (ToM)
b) evidentials that require a developed epistemic vigilance (EV)

Epistemic vigilance is the ability to detect the insufficiency of the communicated information (errors, deception, etc.). The Estonian data can be shown to be unrelated to the insufficient development of theory of mind, since very young infants already possess powerful mechanisms to compute social agents' mental representations (Kovács et al. 2010). Instead, the lack of evidentials is related to epistemic vigilance abilities. More specifically, two-year-olds are not yet fully epistemically vigilant and trust the information offered to them (Mascaro & Sperber 2009). Possibly, it is this ability and not the theory of mind abilities that parallel the linguistic development of the type of evidentials that characterize Estonian.

By extension, the social cognitive developmental prediction about the Udmurt possessive data should be modified as well, if the development of social cognition and language are related.

1. These possessive suffixes and some evidentials are acquired at a similar age (the ToM languages), but other evidentials are acquired at a different age (the epistemic vigilance languages).
2. Persons with impaired cognitive abilities such as autism are likely to

fail in the felicitous use of the ToM-based morphemes in a similar way, and it is not known what the situation with the epistemic vigilance ones is due to the lack of social cognitive research in this area.

3.3. Generics

How can we explain generics in the bigger picture? What motivates their incompatibility with evidentials?

A generic sentence presents a statement about a state of affairs as holding in general; for example, the property of laying eggs characterizes ducks as such and not particular individuals. It provides information about kinds and not about specific individuals and attributes a property of a kind. Examples of generic sentences are *Tigers are striped*, *Ducks lay eggs*, and *Mosquitoes carry the West Nile virus* (Carlson & Pelletier 1995, Krifka et al. 1995, Schubert & Pelletier 1987, Leslie 2008). Genericity covers two phenomena:

(1) reference to kinds (cf. É. Kiss 1998), and

(2) propositions expressing general properties of kinds.

Sentences that present a single episode are called episodic. The statement *Ducks are on the lake* characterizes ducks as particular individuals that are located at a certain place.

The semantic interpretation of generics is a matter of controversy across disciplines. In the case of *Tigers have stripes*, even if some tigers lack stripes, most do have them. In case of *Birds lay eggs*, the majority of the kind in question does not satisfy the predicate; most instances of birds do not lay eggs, but *Birds lay eggs* is true. It is striking that *Birds are female* is not an acceptable generic sentence even if more birds are female than there are specific birds that lay eggs. The sentence *Mosquitoes carry the West Nile virus* or *Ticks carry Lyme disease*, also show that it is not necessary that the majority fulfill the requirement; most mosquitoes or ticks do not carry a virus, yet the sentences *Mosquitoes don't carry the West Nile virus* and *Ticks do not carry Lyme disease* are false for speakers of any language who have some knowledge about the spread of these viruses (Leslie 2008).

In her argumentation, Leslie (2008) points out the lack of overt generic markers (the so-called *GEN* markers) in the languages of the world. She argues that we do not say *GEN tigers have stripes* in the way we might say *Most tigers have stripes*; that is, generic noun phrases are not preceded by an overt generic (*GEN*) operator. It should be remarked at this point, however, that no in-depth typological work on generics has been carried out and the issue is worth pursuing. Leslie points out another paradox: young children learning their native language learn and produce generics far more quickly and readily than they do explicitly quantified sentences. Children start using generics by age two, which is significantly earlier than explicit quantifiers. Explicit quantifiers such as "all", "every", and "some" are more difficult for

young children to acquire – generics are understood more easily than explicit quantifiers (Hollander et al. 2002).

Previous scholarship has established thus a puzzling fact that although languages do not tend to grammaticalize any overt generic operator, it is nevertheless easier for children to interpret a sentence as generic than to interpret an overt quantifier. Recently, developmental psychologists have proposed that the capacity to generalize communicated information is innate. Some experiments have demonstrated that children are biased to receive general, as opposed to specific, knowledge in communicative situations. Children display this genericity bias in pedagogical situations, which explains why they are such good learners – they expect to be taught. The knowledge gained from pedagogical demonstrations is likely to be shared by the cultural community, which is useful for transcending individual experiences and learning about conventions. This innately given bias for genericity is available to infants before they have acquired any language, suggesting that such a disposition is tied to communication rather than to language per se.

It seems that factors such as contextual and linguistic cues and a general cognitive bias determine the interpretation of sentences as generic. Are there perhaps simply unmarked sentences that are preferably interpreted as generic or episodic for other reasons? Does the interpretation of sentences as generic depend on linguistic cues at all? If it does, what are these cues? If it doesn't, is generic and episodic interpretation a matter of grammar at all, and are there then cues in the broader linguistic context that influence the interpretation? If there are, what are they, and if there aren't, could there be extralinguistic context that enables generic interpretation? Can we tease apart the types of context?

In any case, there are many questions that are worth asking and answering. A proper cross-linguistic study on the expression of generics has yet to be carried out. Therefore, I propose some questions that would clarify the issue in the Uralic languages. Are there any peculiarities in the tense, aspect, evidentiality, mood, and definiteness marking in generic sentences? Is reference to kinds marked in the grammar? Are generic sentences encoded as states? Are there differences in encoding stage and individual-level predicates? Are there tense, locative, or other adverbials in the sentence to enhance the disambiguation process? Is it possible to pin down the role of the linguistic context and to distinguish it from non-linguistic context? How do Uralic languages compare with other languages for which we have data?

Linguists working on various linguistic categories have noticed that there are special means for conveying generic as opposed to episodic meaning. The generic-versus-non-generic distinction cross-cuts several grammatical categories. Reference to kinds, generic reference, and generic predicates are discussed under definiteness, number, or quantifiers, impersonals and

infinitives, aspect, tense, mood, and modality. However, linguists have been hesitant to spell out a common denominator for these phenomena, since there is too little evidence for one-to-one mapping between the generic form and function in languages. While the intuitive distinction between generic and non-generic is clear, generic forms co-vary with other grammatical categories. Genericity tends to be grammatically unmarked, or, at least, it tends to show default or less complex marking than non-generic marking. Dahl (2010) glosses a generic morpheme in Sirionó as GENER as in (11), but the information about the marker, its other possible functions and information what it co-occurs with cannot be accessed.

(11) Sirionó [elicited]

Mbae	*tikuasu*	*u*	*kia*	*re?*
what	cow	eat	GENER	Q
Kiata	*chö*	*e-u*	*kia*	*resë.*
grass	FOC	3-eat	GENER	evidently

'What do cows eat? They eat grass.'
Dahl (2010: 56)

The source does not mention more than that generic meaning is sometimes indicated by the particle *kia* in Sirionó, which is combined with a simple form of the verb.

Kees Hengeveld (p.c.) reports about a specific marker on NPs in Wari' and Ndyuka. In Wari', there is a collective marker used for generic NPs. In Ndyuka, generic NPs are characterized by the absence of an article. Dahl (1995: 424) does not find a clear generic–episodic grammatical opposition on the basis of the languages recorded in the typological TAM database. The best candidates of generic markers are found in Wolof, Isekiri, and Maori. Dahl discusses the diachronic pathways that lead to generic–episodic oppositions. They represent a situation where generic readings have become the more salient interpretations of a gram which is yielding territory to another expanding category. In sum, the generic reading does not emerge on its own, but is derived due to the loss of other readings of a grammatical marker.

In the following discussion, the data for which more defensible intuitions can be formed will be examined. Example sentences from earlier literature are compared with Estonian to argue that grammatical encoding clearly constrains the possibility of generic interpretations. An example from Leslie (2008) discusses the generic reading of *OrangeCrusher 2002 crushes oranges* even if no OrangeCrusher 2002 has ever been used. Sentence (12) with the partitive plural marking may be generic, but sentence (13) with the nominative plural cannot be generic. Sentence (12) is generic by default, but it can also be episodic.

(12) Estonian
Generic (by default, it can also be episodic)
OrangeCrusher 2002 *purusta-b* *apelsin-e.*
OC[NOM] crush-3PL orange-PTV.PL
'OrangeCrusher 2002 crushes oranges.'

(13) Estonian
Not generic
OrangeCrusher 2002 *purusta-b* *apelsini-d.*
OC[NOM] crush-3PL orange-NOM.PL
'OrangeCrusher 2002 will crush (the) oranges.'

Even if there is no fire or firemen present, the sentence "Firemen fight fires" may be generic with the partitive plural marking in (14), but sentence (15) with the nominative plural is episodic and it has an aspectual particle.

(14) Estonian
Generic (by default, it can also be episodic)
Tuletõrjuja-d *kustuta-vad* *tulekahju-sid.*
firemen[NOM] fight-3PL fire-PTV.PL
'Firemen fight fires.'

(15) Estonian
Not generic
Tuletõrjuja-d *kustuta-vad* *tulekahju-d* *ära.*
firemen[NOM] fight-3PL fire-NOM.PL PRTC
'Firemen extinguish the fires.'

Can case be a linguistic cue for generics in the Finnic or Uralic languages in general, or languages with case, by extension? Are the aspectual particles related to changing the interpretation, and disabling generic interpretations? Are these examples of generic–episodic distinction just "episodic" in Estonian as well?

The first questions are left for further study, but the generality of the Estonian data is demonstrated by other well-known test sentences from literature on genericity. The sentence "Birds lay eggs" may be generic with the partitive plural marking in (16), but sentence (17) with the nominative plural and an aspectual particle is episodic.

(16) Estonian
Generic (by default, it can also be episodic)
Linnu-d *mune-vad* *mun-e.*
bird-NOM.PL lay-3PL egg-PTV.PL
'Birds lay eggs.'

(17) Estonian
Not generic

Linnu-d	*muneva-d*	*muna-d*	*ära.*
bird-NOM.PL	lay-3PL	egg-NOM.PL	PRTC

'The birds will lay eggs.'

(18) Estonian
Generic (by default, it can also be episodic)

Tiigri-d	*söö-vad*	*inime-si.*
tiger-NOM.PL	eat-3PL	human-PTV.PL

'Tigers eat people.'

(19) Estonian
Not generic

Tiigri-d	*söö-vad*	*inime-sed*	*ära.*
tiger-NOM.PL	eat-3PL	human-NOM.PL	PRTC

'Tigers will eat the people up.'

The examples above are abundant enough to show that the differences in constraining the interpretation as generic or episodic are dependent on the case and the aspectual markers in the sentence in Estonian. This holds true across several well-known example types of generic sentences from the literature. The constraint in these sentences is the transitivity of the sentences – this is needed to demonstrate object case alternation. Plausibly, the same applies to other languages using case and aspectual markers, but this is just a hypothesis at this point.

Are there any other verb-marking devices, for instance, to convey generic knowledge? In Estonian, the impersonal is used for the transmission of general cultural knowledge and can be regarded as a weak generic strategy.

(20) Estonian
Impersonal, transmission of general cultural knowledge

Nii	*ei*	*tehta!*
so	NEG	do-IPS

'This is not the way to do things!'

Why is the impersonal a strategy, not a marker of genericity on a verb? The impersonal cannot be used for the transmission of general cultural knowledge about nonhumans, and so it cannot be regarded as a proper generic marker.

(21) Estonian

% Muneta-kse	*mun-e.*
lay-IPS	egg-PTV.PL

'Birds lay eggs (impersonal).'

Linguists have invested much energy into researching isolated phenomena of genericity as manifested in the category of tense, aspect, or mood, and the syntax of incorporation. Linking general cognitive dispositions to the cross-linguistic tendency to express genericity with less complex grammatical marking has the potential to provide a novel explanation in linguistics.

3.4. Evidentials again

Returning to the evidentials, the suggested social cognition based typology of theory of mind evidentials and epistemic vigilance evidentials can be related to optionality. Some languages such as Cuzco Quechua (Faller 2002) encode indirectness and have a system tending towards more obligatory marking. Faller recalls an instance that is telling at this point. When an old informant with poor auditory perception could not understand the question that she was asking, another participant in the conversation "translated" the question by repeating it in a louder voice, without a foreign accent, and adding the indirect evidential. This example leads to the following thoughts:

a) The Cuzco Quechua evidential is more obligatory than the Estonian one, which would not occur in this context of "translating" into louder speech. Faller (2007: 4) describes a situation where the speaker, the mediator, and the hearer may even be present in the same speech situation: "For example, the mother-in-law of one of my consultants is very hard of hearing, and she would often not understand me. My consultant would then literally amplify me by repeating very loudly what I had said and in doing so she would use the reportative." Example (22) was reconstructed by Martina Faller to illustrate the exact interaction:

(22a) Martina Faller to mother-in-law:
Imayna-n ka-sha-nki.
how-BPG be-PROG-2
'How are you?'

(22b) Consultant to mother-in-law:
Imayna-s ka-sha-nki.
how-REP be-PROG-2
'(She says) How are you?'
Faller (2007: 4)

b) If an Estonian evidential were used in this situation, it would create extra implicatures about the judgement of the "translator" of the message of the original speaker, such as a lower degree of evidence. Since questions about a participant in the speech situation cannot provide any evidence, the possible implicatures would not be available and the use of an Estonian evidential would seem strange.

(23) Estonian

%Vanaema,	*kas*	*Su*	*kõrva-d*
granny	Q	your	ear-NOM.PL
*ole-**vat***	*suure-d?*		
be-PTV_EVID	big-NOM.PL		

Not possible to interpret as: 'Granny, are your ears big? (she asked)'

c) In some languages, explicit marking appears only in case epistemic vigilance needs to be increased alongside with communicating the mediated nature of the information.

In a language with several evidentials, it could be predicted that theory of mind evidentials are acquired before epistemic vigilance ones. In the Udmurt example, it is worth finding out which of the evidential strategies is acquired first and what the social cognitive skills are that are paired with the acquisition of them. Also, it is predicted that if the linking of participants in speech and narrated events as it is carried out with the possessive suffixes in Udmurt is dependent on theory of mind, then the grammar is acquired relatively early.

3.5. Explanations

What explains the data from the CHILDES corpus? The corpus may be somewhat restricted for the purposes of a thorough study, but I offer a hypothesis here. The Estonian motherese as it is addressed to two-year-olds lacks evidentials and contains several generic sentences, because in natural mother–child interactions, communication is keyed to generating general knowledge (Csibra & Gergely 2011). Children are keyed to learning generic knowledge instead of epistemic vigilance in natural mother–child interactions. They search for essential features (Gelman 2003) and give kind-related interpretations. Communicative function demonstration induces kind-based artifact representation, even as early as the preverbal stage (Futó et al. 2010). Evidentials, on the other hand, can be split into those that require a theory of mind and those that (also) require the development of epistemic vigilance. Those evidentials that require vigilance are likely to develop later and not co-occur with generic statements.

4. Questions for further research

Before turning to the solutions and typological issues, it is necessary to pose some questions for further research.

One such question is the following: Would the existence of evidentials – and the Uralic languages typically have at least evidential strategies – influence social cognition in a culture-specific way? Another set of questions follows: What does the divergence in typologically similar systems suggest

about the link to the development of social cognition? Why do we need to link speech events to the events in narration? What are the goals that we achieve in communication and in social cognition by using these more or less grammaticalized strategies? What is the role of grammaticalization?

In sum, the research of both generics and evidentials has several open questions that would be interesting to study in the context of social cognition, social cognitive development, and a richer database including Uralic languages.

5. Concluding remarks

Several poorly understood relationships between evidentiality and seemingly unrelated linguistic phenomena such as generics and possessives become clearer if the results of social cognitive developmental studies and typologically larger databases of languages are combined. Uralic languages differ greatly in the expression of evidentiality and a proper research on generics has not yet been completed. Generics pose a problem in several fields. In generic sentences, linguistic cues, context, and a cognitive bias determine the interpretation. There are specific linguistic cues for genericity: case marking, definiteness marking, lack of tense marking, word order, and the impersonal. Perhaps there is a generic marker in one of the Uralic languages, but on the basis of typological knowledge, this is unlikely. There are many avenues to explore that would combine the research agendas of Uralic typology, social cognition, and cognitive development. I have proposed a developmentally and social cognitively motivated typology of theory of mind evidentials and epistemic vigilance evidentials. In addition, I have suggested a social cognitive developmental answer to the question of why evidentials and generics tend to appear in mutually exclusive contexts. This explanation links up with the natural pedagogy research agenda. I have offered some testable hypotheses about the acquisition of other categories such as the Udmurt possessive marking. This paper is by no means conclusive, but its goal has been to ask questions and provide data, in order to provoke thoughts and hypotheses for further study.

Abbreviations

1PRT – first preterite
2PRT – second preterite
2S – second person singular marker
3S – third person singular marker
3PL – third person plural marker
ACC – accusative, or the morphological genitive or nominative as an aspectual object case in Finnish
AUX – auxiliary
BPG – best possible grounds

CNG – connegative
DAT – dative
ELA – elative
FOC – focus
GEN – genitive
GENER – generic marker
GER – gerund
INF – infinitive
ILL – illative
INS – inessive
INST – instrumental
INTR – interrogative
IPS – impersonal
NEG – negation (particle)
NOM – nominative
PL – plural
PRL – prolative
PROG – progressive
PRT – preterite
PRTC – particle
PRES – present
PTC – participle
PTV – partitive
PTV_EVID – partitive evidential
PRS – present
REP – reportative
SG – singular
Q – question particle
% – a sign that indicates that the interpretation is not felicitous

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